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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/699,737	11/04/2003	Reiko Arai	520.43257X00	6438

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EXAMINER

BERNATZ, KEVIN M

ART UNIT PAPER NUMBER

1773

DATE MAILED: 05/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/699,737	ARAI ET AL.	
	Examiner	Art Unit	
	Kevin M. Bernatz	1773	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Response to Amendment

1. Amendments to the specification and claims 1, 2, 10 and 11, filed on February 8, 2006, have been entered in the above-identified application.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 1 – 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 10 recite the language a "soft magnetic underlayer consisting of" several layers and "a domain control layer **which includes at least an anti-ferromagnetic layer**" (*emphasis added*), including several dependent claims clearly indicating that the domain control layer includes additional layers. These use of the transitional phrase "consisting of", which is closed to additional elements and the phrase "which includes at least" is improper, since the question of what is excluded and what is allowed is uncertain. One of ordinary skill in the art would not be appraised of what extra layers would be allowed per the "at least" language versus what would be

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excluded per the “consisting of” language. For the purpose of evaluating the prior art, the Examiner has given the claim the broadest reasonable interpretation and has allowed for any number of layers between “first” and “second” soft magnetic layers to still read on the claimed limitation.

Claim Rejections - 35 USC § 102

5. Claims 1 – 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Hikosaka et al. (U.S. Patent No. 5,942,342) as evidenced by Tanahashi et al. (U.S. Patent App. No. 2002/0048693 A1) and Iwasaki et al. (U.S. Patent No. 6,395,388 B1) for the reasons of record as set forth in Paragraph No. 5 of the Office Action mailed on September 30, 2005.

Regarding the amended language “said soft magnetic layer consisting of ... in this order from said substrate”, the Examiner notes that this limitation is met since the claimed “domain control layer” is still open to an infinite number of layers, provided at least one is an antiferromagnetic layer.

Regarding the amended language “the energy of the exchange bias field Hex2 ... to said first soft magnetic layer”, this limitation is met by simply choosing the antiferromagnetic layer in Figure 5 which is closer to what is called the “second soft magnetic layer” versus what is called the “first soft magnetic layer” (i.e. in Figure 5, the “first soft magnetic layer” could be taken as the element 12 adjacent element 11, the domain control layer as the element 14 nearest element 13 and the second soft magnetic layer as the element 12 between the “domain control layer” and element 13.

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As such, Hex2 will be much larger than Hex1 since the domain control layer is adjacent the second soft magnetic layer, but separated from the first soft magnetic layer.

Regarding the amended language “in a magnetization curve ... shift quantity) Hex”, the Examiner notes that this limitation is deemed to be inherently met by the disclosed structure since Hikosaka et al. explicitly teach controlling the coercivity to be smaller than the exchange bias field Hex in the radial direction, as noted in Paragraph 5 of the Office Action mailed September 30, 2005.

Regarding the amended language of claims 2 and 11, the Examiner notes that this limitation was previously recited in claim 1 and is taught for the reasons of record noted in Paragraph 5 of the Office Action mailed September 30, 2005.

Response to Arguments

6. The rejection of claims 1 - 13 under 35 U.S.C § 102(b) – Hikosaka et al.

Applicant(s) arguments have been considered but are moot in view of the new ground(s) of rejection. In so far as they apply to the present rejection of record, applicant(s) argue “these three layers are deposited in this specific order relative to the location of the substrate” (*page 11 of response*) and that “the magnetic recording medium of independent claim 1 contains only two soft magnetic layers” (*pages 12 - 14 of response*). The Examiner respectfully disagrees.

As noted above, applicants' claims are not limited to “three” layers, but are open to effectively an infinite number of layers provided the first and last layers are soft magnetic layers. This includes additional soft magnetic layers.

Should applicants desire to limit their claims to the structure argued, the Examiner notes that there are essentially 5 embodiments that must be claimed. These embodiments possess the following structures:

- 1) 1st soft/ AFM layer / 2nd soft (e.g. claim 1)
- 2) 1st soft/ FM layer / AFM layer / FM layer/ 2nd soft (e.g. claim 5,8,10)
- 3) 1st soft / FM layer/ AFM layer/ 2nd soft (e.g. claim 5,8,10)
- 4) 1st soft/ AFM layer / FM layer/ 2nd soft (e.g. claim 5,8,10)
- 5) 1st soft/ 3rd soft / AFM layer / 2nd soft (e.g. claim 7)

For embodiment 1, applicants can use the current claim language while reciting that the domain control layer consists of an AFM layer. For embodiments 2 – 4, applicants can include language to the effect of “an optionally consisting of ferromagnetic layers between and directly adjacent the first and/or second soft magnetic layer and said AFM layer” (or something similar). For embodiment 5, applicants can use the language “consisting of a first soft magnetic layer, a soft magnetic seed layer directly adjacent said 1st soft magnetic layer, an AFM layer directly adjacent said soft magnetic seed layer and a second soft magnetic layer directly adjacent said AFM layer, in this order from said substrate”. The Examiner notes that the above recitations of “suitable” claim language are merely examples of language which the Examiner believes would cover the scope argued by applicants and are not meant to be the only possible language which would bring the claims more in agreement with the argued language.

The Examiner notes that amendment of the claims as noted above would require further search and/or consideration and would likely not be entered in an amendment after-final. Should applicants desire to pursue the embodiments recited above, applicants are suggested to file an RCE incorporating the substantial claim amendments required, or other continuation-type applications.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

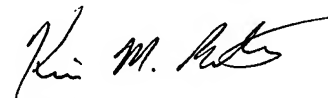
8. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Kevin M Bernatz whose telephone number is (571) 272-1505. The examiner can normally be reached on M-F, 9:00 AM - 6:00 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on (571) 272-1284. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KMB
April 26, 2006


Kevin M. Bernatz, PhD
Primary Examiner